

John Ashburner

PERSONAL DETAILS Professor (since 2011)
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DOB: 23rd January, 1967 Nationality: British

EDUCATION / QUALIFICATIONS	Dates	Detail of degree	Institution
	1988	BSc 2(ii) Biochemistry	University of Leeds, Leeds, UK
	1989	MSc Information Technology	Aston University, Birmingham, UK
	2000	PhD Neuroscience	University College London, UK

PROFESSIONAL HISTORY

- MRC Cyclotron Unit, Hammersmith Hospital, London, UK
 1989-1995 Computer Officer.
- Wellcome Trust Centre for Neuroimaging, 12 Queen Square, London, UK
 1995- Computer Programmer.
 2002-2003 Lecturer.
 2003-2006 Senior Lecturer.
 2006-2011 Reader.
 2011- Professor.

OTHER APPOINTMENTS AND AFFILIATIONS

- 2010- Member of *Organization for Human Brain Mapping Scientific Program Committee*.
- 2006-2011. A handling editor for the journal *NeuroImage*. This involved finding suitable experts to review manuscripts, reading their comments and making decisions about suitability for publication. I handled over 570 submissions.
- Reviewer for articles in a number of journals, including *NeuroImage*, *Human Brain Mapping*, *IEEE Transactions in Medical Imaging*, *PLoS Computational Biology*, *Journal of Neuroscience Methods*, *Computer Methods and Programs in Biomedicine*, *Annals of Applied Statistics* and *Journal of Neuroscience*.
- Programme committee member for *1st ICPR Workshop on Brain Decoding*.
- Reviewer for the *7th – 13th International Conferences on Medical Image Computing and Computer Assisted Intervention*, *IEEE International Symposium on Biomedical Imaging 2010* and abstracts for the *10th – 16th Annual Meetings of the Organization for Human Brain Mapping*.
- Reviewer for *RAEng*, *ERC*, *EPSRC*, *ERA-Net NEURON* and *Research Council of Norway* grant applications.

PRIZES, AWARDS AND HONOURS

- 2003. Co-recipient of the *IgNobel Prize* for Medicine, for presenting evidence that the brains of London taxi drivers are more highly developed than those of their fellow citizens [Maguire et al, 2000].
- 2006. Recipient of the *Wiley Young Investigator Award* in Human Brain Mapping.

GRANTS

I am funded by the core grant of the Wellcome Trust Centre of Neuroimaging, as my software development role enables our departmental investigators to achieve their research objectives.

- *2005–2010.* Co-applicant on *Structure and Function in Clinical Neurology* Programme Grant. GR075696AIA The Wellcome Trust. With R.S.J. Frackowiak and S. Tabrizi (£610,000, 5 year project).

INVITED TALKS

Since 2007:

- *fMRI Course* at the 13th Annual Meeting of the Organization for Human Brain Mapping. Chicago, USA. 10th June, 2007.
- *School of Magnetic Resonance Techniques.* Milan, Italy. Dec, 2007.
- *Recent Advances in MRI and Lesion Reconstruction Techniques Workshop.* Budapest, Hungary. 21st April, 2008.
- *UCL-CNT workshop on VBM of anatomical MRI and DT.* Wellcome Trust Centre for Neuroimaging, London, UK. 24th April, 2008.
- *International School on Magnetic Resonance and Brain Function - VI Workshop.* Erice, Italy. 21st May, 2008.
- *Graduate Summer School: Mathematics in Brain Imaging.* Institute for Pure and Applied Mathematics, University of California - Los Angeles, USA. 17th July, 2008.
- *Annual Meeting of the European HD Network (Imaging Working Group).* Lisbon, Portugal. 4th September, 2008.
- *Anglo-Nordic Networking Seminar ("The Aging Brain").* London, UK. 8th Dec, 2008.
- *One day British Machine Vision Association symposium ("Group Theory, Invariance & Symmetry in Vision").* London, UK. 21st Jan, 2009.
- *MBIC fMRI Workshop.* Maastricht, The Netherlands. 19th Feb, 2009.
- *fMRI Advanced Issues and Processing Software* educational session of *ISMRM.* Honolulu, USA. 19th April, 2009.
- *Longitudinal Image Analysis Issues in MS* meeting. Siena, Italy. 4th June, 2009.
- *European Meeting on Challenges in Modern Massive Data Sets (EMMDS),* Copenhagen, Denmark. 2nd July, 2009.
- *SPM Course,* Liege, Belgium. 8th September, 2009.
- *SIAM Conference on Imaging Science,* Chicago, USA. 12th April, 2010.
- *Edinburgh SPM Course 2010,* UK. 26-29th April, 2010.
- *MBIC fMRI Workshop.* Maastricht, The Netherlands. 1st June, 2010.
- *Edinburgh SPM Course 2011,* UK. 11-14th April, 2011.
- *Machine Learning and NeuroImaging* Workshop, Marseille, France. 8-9th November, 2011.
- *MBIC fMRI Workshop.* Maastricht, The Netherlands. 22nd March, 2012.
- *SPM Course.* Lausanne, Switzerland. 12-13th April, 2012.

ACADEMIC
SUPERVISION

- 2006–2009 Primary PhD supervisor of *Carlton Chu*. The project was on applying pattern recognition methods to MRI. Dr Chu is now a post-doc at NIMH.
- 2008–2011 Primary PhD supervisor of *Christian Lambert*, who is a medical student doing a project on computing brain atlases from diffusion MRI.
- 2006–2010 Tertiary PhD supervisor of *Geoffrey Tan*, whose project is on the genetic causes of neuroanatomical variability. Dr Tan has just submitted his thesis and continues his medical training.
- 2006– Secondary PhD supervisor of part time student *Hester Breman* (Maastricht, The Netherlands). The project is on distortion correction methods for echo-planar images.
- 2010– Secondary PhD supervisor of part time student *Gemma Monté* (Barcelona, Spain). The project is on computational anatomy applied to schizophrenia.
- 2011– Secondary PhD supervisor of *Jonathan Young*, whos project is on shape analysis for understanding Alzheimer's and other neurogenerative diseases.

RESEARCH
SUMMARY

I develop generative models of images, which are distributed as part of the *SPM* software package and used by thousands of neuroimagers, both nationally and internationally. Modelling is over three spatial dimensions and often over entire collections of images, and follows the principles layed out by *Pattern Theory*. Rather than applying series of separate tools to the data, a theme of my work is to model the primary image data, which involves unifying traditionally separate image processing steps. While satisfying the current needs of neuroimagers, developments are also aimed at addressing some of the data-intensive science likely to emerge in the future.

Understanding differences among populations of subjects requires biologically plausible models of inter-subject variability. Such models are applicable to relating genetics to brain structure, and also to studies leading to an understanding of development, aging and disease. Much of my work concerns modelling inter-subject variability, which primarily involves estimating different brain configurations, through image registration. The ability to achieve accurate alignment among the brains of different subjects has an extremely diverse range of applications, both within basic science and in translational work.

I also work on tissue classification methods for MR images, being among the first in the neuroimaging field to use tissue probability maps to guide image segmentation and to combine nonlinear registration into the same generative model. My work on tissue classification has led to me being associated with a technique known as *Voxel-Based Morphometry* (VBM), which is a technique for localising brain areas that may differ in volume among various groups of subjects. It has been applied to many different subject populations, both locally and internationally, and my 2001 paper on VBM now has over 2,350 citations.

A current aim is to develop models that can be applied to a large number of subjects to address important issues in clinical neurology. This involves developing a strategy where features from anatomical scans within labelled groups are employed as training sets to develop accurate models of the differences among groups. Model accuracy may be ascertained by the ability to predict the group memberships of unlabeled scans, although Bayesian model selection may also be used by some approaches. There are many ways of characterising such differences, but in my view the most accurate representation is that which is best able to separate the populations or to predict the measure of interest. In addition to providing accurate characterisation of differences for use in basic science, such models have potential translational applications.

TEACHING ACTIVITY	<p>From 2007.</p> <ul style="list-style-type: none"> • <i>SPM Short Course</i>. Institute of Neurology, London, UK. May, 2007. • <i>SPM Short Courses</i>. Institute of Neurology, London, UK. May & Oct, 2008. • <i>SPM Short Courses</i>. Institute of Neurology, London, UK. May & Oct, 2009. • <i>SPM Short Courses</i>. Institute of Neurology, London, UK. May & Oct, 2010. • <i>SPM Short Courses</i>. Institute of Neurology, London, UK. May & Oct, 2011. • <i>PhD vivas</i>: Internal examiner - UCL (1 candidate) and Kings (1 candidate). External examiner - Imperial College (1 candidate), University of Cambridge (1 candidate), University of Maastricht (2 candidates), University of Lund (1 candidate) and Technical University of Denmark (1 candidate).
KNOWLEDGE TRANSFER / EXCHANGE ACTIVITY	<p>My main areas of knowledge transfer concern the <i>SPM</i> software, which is developed in the department. User documentation is provided, and limited support is offered via a <i>JISCMail</i> list (currently 4,286 subscribers). Much of this involves explaining engineering and computer science concepts to investigators in other domains such as psychology, neurology and neuroscience. I provide some support for the <i>SPM</i> software, which includes over 1,000 emails sent to the <i>SPM</i> mailing list since 2007. These are to advise investigators, both nationally and internationally, with software and modelling issues. A larger number of responses were also sent off-list, in response to direct emails. Some of these concerned translational applications of the <i>SPM</i> software, but I have not kept a record of all of these. I wrote 94 pages of the <i>SPM Manual</i>, which the thousands of users refer to. Since 2007, I have contributed six textbook chapters about the software.</p> <p>Until recently, I was a member of the <i>NIfTI Data Format Working Group</i>, which was charged with arriving at a technical solution to the problem of multiple data formats used in fMRI research. The primary goal of NIfTI was to provide coordinated and targeted service, training, and research to speed the development and enhance the utility of informatics tools related to neuroimaging. The National Institute of Mental Health and the National Institute of Neurological Disorders and Stroke were joint sponsors of this international initiative.</p>
ENABLING ACTIVITY	<p>Without image analysis software, the neuroimaging field would have achieved nothing. I am a main co-author (contributed about 45,000 lines of code) of <i>SPM</i>. Internationally, this is the most widely used neuroimaging software package for modelling functional and structural neuroimaging data. Algorithms are developed (research activity) and incorporated into <i>SPM</i>, which is made freely available to the international neuroimaging community. In addition to its use within a number of UCL departments, this software also enables thousands of neuroimagers around the world to model their data.</p> <p>Much of the <i>SPM</i> coding is intended to address common queries arising from the mailing list. Some relate to visualisation, file formats and issues of compatibility with other software, which do not lead to serious academic developments. Other situations address problems for which others have published solutions, so some coding involves re-implementations of mathematical algorithms from the literature. Although no publications may arise directly from such work, it is important for the work of many investigators.</p>
ADMINISTRATION	<p><i>Organization for Human Brain Mapping Scientific Program Committee (Chair of Education Subcommittee)</i>. This involves a variety of administrative duties relating to organising the OHBM conference – especially the educational sessions.</p>
FIVE MOST SIGNIFICANT PUBLICATIONS	<p>Most cited publications since 2007 (ISI Web of Knowledge):</p>

1. **Ashburner J (2007):** *A fast diffeomorphic image registration algorithm.* *NeuroImage* 38(1):95–113. **412 citations.**
2. Klein A, Andersson J, Ardekani BA, **Ashburner J**, Avants B, Chiang MC, Christensen GE, Collins DL, Gee J, Hellier P, Song JH, Jenkinson M, Lepage C, Rueckert D, Thompson P, Vercauteren T, Woods RP, Mann JJ, Parsey RV (2009): *Evaluation of 14 nonlinear deformation algorithms applied to human brain MRI registration.* *NeuroImage* 46(3):786–802. **197 citations.**
3. Kloppel S, Stonnington CM, Chu C, Draganski B, Scahill RI, Rohrer JD, Fox NC, Jack CR, **Ashburner J**, Frackowiak RSJ (2008): *Automatic classification of MR scans in Alzheimers disease.* *Brain* 131:681–689. **170 citations.**
4. Draganski B, Kherif F, Klöppel S, Cook PA, Alexander DC, Parker GJM, Deichmann R, **Ashburner J** & Frackowiak RSJ (2008): *Evidence for segregated and integrative connectivity patterns in the human basal ganglia.* *Journal of Neuroscience* 28(28):7143-7152. **99 citations.**
5. Draganski B, Kherif F, Kloeppe S, Cook PA, Alexander DC, Parker GJM, Deichmann R, **Ashburner J**, Frackowiak RSJ (2008): *Evidence for segregated and integrative connectivity patterns in the human basal ganglia.* *Journal of Neuroscience* 28(28):7143–7152. **72 citations.**

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CO-EDITED BOOKS

1. *Human Brain Function, 2nd Edition.* Academic Press, San Diego. Frackowiak RSJ, Friston KJ, Frith CD, Dolan RJ, Price CJ, Zeki S, **Ashburner J** & Penny W (eds.).
2. *Statistical Parametric Mapping: The Analysis of Functional Brain Images.* Elsevier, New York. Friston KJ, **Ashburner J**, Kiebel SJ, Nichols TE & Penny W (eds.).

CHAPTERS IN BOOKS

1. **Ashburner J** & Friston KJ (1997): *Spatial transformation of images.* In *Human Brain Function*, Chap. 3, pp 43–58. Academic Press, San Diego. Frackowiak RSJ, Friston KJ, Frith CD, Dolan RJ & Mazziotta JC (eds.).
2. **Ashburner J** & Friston KJ (1998): *Spatial normalization.* In *Brain Warping*, Chap. 2, pp 27–44. Academic Press, San Diego. Toga A (ed.).
3. **Ashburner J** & Friston KJ (1999): *Image registration.* In *Functional MRI*, Chap. 26, pp 285–299. Springer-Verlag, Berlin. Moonen CTW & Bandettini PA (eds.).
4. **Ashburner J** & Friston KJ (2003): *Rigid body registration.* In *Human Brain Function, 2nd Edition*, Chap 32, pp 635–653. Academic Press, San Diego. Frackowiak RSJ, Friston KJ, Frith CD, Dolan RJ, Price CJ, Zeki S, **Ashburner J** & Penny W (eds.).
5. **Ashburner J** & Friston KJ (2003): *Spatial normalization using basis functions.* In *Human Brain Function, 2nd Edition*, Chap 33, pp 655–672. Academic Press, San Diego. Frackowiak RSJ, Friston KJ, Frith CD, Dolan RJ, Price CJ, Zeki S, **Ashburner J** & Penny W (eds.).
6. **Ashburner J** & Friston KJ (2003): *High-dimensional image warping.* In *Human Brain Function, 2nd Edition*, Chap 34, pp 673–694. Academic Press, San Diego. Frackowiak RSJ, Friston KJ, Frith CD, Dolan RJ, Price CJ, Zeki S, **Ashburner J** & Penny W (eds.).

7. **Ashburner J** & Friston KJ (2003): *Image segmentation*. In *Human Brain Function, 2nd Edition*, Chap 35, pp 695–706. Academic Press, San Diego. Frackowiak RSJ, Friston KJ, Frith CD, Dolan RJ, Price CJ, Zeki S, **Ashburner J** & Penny W (eds.).
8. **Ashburner J** & Friston KJ (2003): *Morphometry*. In *Human Brain Function, 2nd Edition*, Chap 36, pp 707–722. Academic Press, San Diego. Frackowiak RSJ, Friston KJ, Frith CD, Dolan RJ, Price CJ, Zeki S, **Ashburner J** & Penny W (eds.).
9. **Ashburner J** & Friston KJ (2007): *Rigid body registration*. In *Statistical Parametric Mapping: The Analysis of Functional Brain Images*, Chap 4, pp 49–62. Elsevier, New York. Friston KJ, **Ashburner J**, Kiebel SJ, Nichols TE & Penny W (eds.).
10. **Ashburner J** & Friston KJ (2007): *Non-linear registration*. In *Statistical Parametric Mapping: The Analysis of Functional Brain Images*, Chap 5, pp 63–80. Elsevier, New York. Friston KJ, **Ashburner J**, Kiebel SJ, Nichols TE & Penny W (eds.).
11. **Ashburner J** & Friston KJ (2007): *Segmentation*. In *Statistical Parametric Mapping: The Analysis of Functional Brain Images*, Chap 6, pp 81–91. Elsevier, New York. Friston KJ, **Ashburner J**, Kiebel SJ, Nichols TE & Penny W (eds.).
12. **Ashburner J** & Friston KJ (2007): *Voxel-based Morphometry*. In *Statistical Parametric Mapping: The Analysis of Functional Brain Images*, Chap 7, pp 92–99. Elsevier, New York. Friston KJ, **Ashburner J**, Kiebel SJ, Nichols TE & Penny W (eds.).
13. **Ashburner J** & Friston KJ (2009): *Imaging techniques: Voxel based morphometry*, Chap 306. In the *Encyclopedia of Neuroscience*. Elsevier. Squire LR (ed.).
14. **Ashburner J** (2009): *Preparing fMRI Data for Statistical Analysis*, In *Functional MRI Techniques*. Humana Press. Filippi M (ed.).

JOURNAL
RESEARCH
ARTICLES

1. Jones AK, Qi LY, Fujirawa T, Luthra SK, **Ashburner J**, Bloomfield P, Cunningham VJ, Itoh M, Fukuda H & Jones T (1991): *In vivo distribution of opioid receptors in man in relation to the cortical projections of the medial and lateral pain systems measured with positron emission tomography*. *Neuroscience Letters*. 126(1):25–28
2. Rajeswaran S, Hume SP, Cremer JE, Young J, Bailey DL, **Ashburner J**, Luthra SK, Jones AK & Jones T (1991): *Dynamic monitoring of [C-11]diprenorphine in rat brain using a prototype positron imaging device*. *Journal of Neuroscience Methods*. 40(2-3):223–232
3. Jones AK, Cunningham VJ, Ha-Kawa SK, Fujiwara T, Liyii Q, Luthra SK, **Ashburner J**, Osman S & Jones T (1994): *Quantitation of [C-11]diprenorphine cerebral kinetics in man acquired by PET using presaturation, pulse-chase and tracer-only protocols*. *Journal of Neuroscience Methods*. 51(2):123–134
4. Silbersweig DA, Stern E, Schnorr L, Frith CD, **Ashburner J**, Cahill C, Frackowiak RS & Jones T (1994): *Imaging transient, randomly occurring neuropsychological events in single subjects with positron emission tomography: an event-related count rate correlational analysis*. *Journal of Cerebral Blood Flow and Metabolism*. 14(5):771–782

5. Friston KJ, **Ashburner J**, Frith CD, Poline J-B, Heather JD & Frackowiak RSJ (1995): *Spatial registration and normalization of images*. Human Brain Mapping. 3(3):165–189
6. Hermansen F, Bloomfield PM, **Ashburner J**, Camici PG & Lammertsma AA (1996): *Linear dimension reduction of sequences of medical images: II. direct sum decomposition*. Physics in Medicine and Biology. 40(11):1921–1941
7. Labbe C, Froment JC, Kennedy A, **Ashburner J** & Cinotti L (1997): *Positron emission tomography metabolic data corrected for cortical atrophy using magnetic resonance imaging*. Alzheimer Disease and Associated Disorders. 10(3):141–170
8. Koepp MJ, Richardson MP, Labbe C, Brooks DJ, Cunningham VJ, **Ashburner J**, Van Paesschen W, Revesz T & Duncan JS (1997): *[C-11] flumazenil PET volumetric MRI and quantitative pathology in mesial temporal lobe epilepsy*. Neurology. 49(3):764–773
9. **Ashburner J** & Friston KJ (1997): *Multimodal image coregistration and partitioning - a unified framework*. NeuroImage. 6(3):209–217
10. Kiebel SJ, **Ashburner J**, Poline J-B & Friston KJ (1997): *MRI and PET coregistration - A cross validation of Statistical Parametric Mapping and Automated Image Registration*. NeuroImage. 5(4):271–279
11. Richardson MP, Friston KJ, Sisodiya SM, Koepp MJ, **Ashburner J**, Free SL, Brooks DJ & Duncan JS (1997): *Cortical grey matter and benzodiazepine receptors in malformations of cortical development. A voxel-based comparison of structural and functional imaging data*. Brain. 120:1961–1973
12. **Ashburner J**, Neelin P, Collins DL, Evans AC & Friston KJ (1997): *Incorporating prior knowledge into image registration*. NeuroImage. 6(4):344–352
13. Vargha-Khadem F, Watkins KE, Price CJ, **Ashburner J**, Alcock KJ, Connelly A, Frackowiak RSJ, Friston KJ, Pembrey ME, Mishkin M, Gadian DG & Passingham RE (1998): *Neural basis of an inherited speech and language disorder*. Proc. Natl. Acad. Sci. USA 95:12695–12700
14. Hermansen F, **Ashburner J**, Spinks TJ, Kooner JS, Camici PG & Lammertsma AA (1998): *Generation of myocardial factor images directly from the dynamic oxygen-15-water scan without use of an oxygen-15-carbon monoxide blood-pool scan*. Journal of Nuclear Medicine. 39(10):1696–702
15. **Ashburner J**, Hutton C, Frackowiak RSJ, Johnsrude I, Price C & Friston KJ (1999): *Identifying global anatomical differences: deformation-based morphometry*. Human Brain Mapping. 6(5):348–357
16. Krams M, Quinton R, **Ashburner J**, Friston KJ, Frackowiak RS, Bouloux PM & Passingham RE (1999): *Kallmann's syndrome: mirror movements associated with bilateral corticospinal tract hypertrophy*. Neurology 52(4):816–822
17. Chawla D, Büchel C, Edwards R, Howesman A, Josephs O, **Ashburner J** & Friston KJ (1999): *Speed-dependent responses in V5: a replication study*. NeuroImage 9:508–515
18. Ito K, Morrish PK, Rakshi JS, Uema T, **Ashburner J**, Bailey DL, Friston KJ & Brooks DJ (1999): *Statistical parametric mapping with F-18-dopa PET demonstrates bilaterally reduced striatal and nigral dopaminergic function in early Parkinson's disease*. J. Neurol. Neurosurg. Psychiatry. 66(6): 754–758
19. **Ashburner J**, Andersson JLR & Friston KJ (1999): *High-dimensional image registration using symmetric priors*. NeuroImage 9(6):619–628

20. Price CJ, Veltman DJ, **Ashburner J**, Josephs O & Friston KJ (1999): *The critical relationship between the timing of stimulus presentation and data acquisition in blocked designs with fMRI*. *NeuroImage* 10:36–44
21. May A, **Ashburner J**, Büchel C, McGonigle DJ, Friston KJ, Frackowiak RSJ & Goadsby PJ (1999): *Correlation between structural and functional changes in brain in an idiopathic headache syndrome*. *Nature Medicine* 5(7):836–838
22. **Ashburner J** & Friston KJ (1999): *Nonlinear spatial normalization using basis functions*. *Human Brain Mapping*. 7(4):254–266
23. Mummery CJ, **Ashburner J**, Scott SK, Wise RJ (1999): *Functional neuroimaging of speech perception in six normal and two aphasic subjects*. *J Acoust Soc Am* 106(1):449–57
24. Rakshi JS, Uema T, Ito K, Bailey DL, Morrish PK, **Ashburner J**, Dagher A, Jenkins IH, Friston KJ & Brooks DJ (1999): *Frontal, midbrain and striatal dopaminergic function in early and advanced Parkinson's disease: a 3D [(18)F]dopa-PET study*. *Brain* 122:1637–50
25. Woermann FG, Free SL, Koepp MJ, **Ashburner J** & Duncan JD (1999): *Voxel-by-voxel comparison of automatically segmented cerebral grey matter – a rater-independent comparison of structural MRI in patients with epilepsy*. *NeuroImage* 10:373–384
26. Abell F, Krams M, **Ashburner J**, Passingham RE, Friston KJ, Frackowiak RSJ, Happé F, Frith CD & Frith U (1999): *The neuroanatomy of autism: a voxel based whole brain analysis of structural scans*. *NeuroReport*. 10(8):1647–1651
27. Mummery CJ, Patterson K, Price CJ, **Ashburner J**, Frackowiak RSJ & Hodges JR (2000): *A Voxel-based morphometry study of semantic dementia: relationship between temporal lobe atrophy and semantic memory*. *Annals of Neurology* 47:36–45
28. Grootenck S, Hutton C, **Ashburner J**, Howseman AM, Josephs O, Rees G, Friston KJ & Turner R (2000): *Characterization and correction of interpolation effects in the realignment of fMRI time series*. *NeuroImage* 11(1):49–57
29. Maguire EA, Gadian DG, Johnsrude IS, Good CD, **Ashburner J**, Frackowiak RSJ & Frith CD (2000): *Navigation-related structural change in the hippocampi of taxi drivers*. *Proceedings of the National Academy of Sciences* 97(8):4398–4403
30. **Ashburner J**, Andersson JLR & Friston KJ (2000): *Image registration using a symmetric prior – in three-dimensions*. *Human Brain Mapping* 9(4):212–225
31. **Ashburner J** & Friston KJ (2000): *Voxel-based morphometry – the methods*. *NeuroImage* 11(6):805–821
32. Deichmann R, Good CD, Josephs O, **Ashburner J** & Turner R (2000): *Optimization of 3-D MP-RAGE sequences for structural brain imaging*. *NeuroImage* 12(1):112–127
33. Giraud A-L, Lorenzi C, **Ashburner J**, Wable J, Johnsrude I, Frackowiak R & Kleinschmidt A (2000): *Representation of the temporal envelope of sounds in the human brain*. *J. Neurophysiol.* 84:1558–1598
34. Salmond C H, **Ashburner J**, Vargha-Khadem F, Gadian DG & Friston KJ (2000): *Detecting bilateral abnormalities with voxel-based morphometry*. *Human Brain Mapping* 11(3):223–232
35. Ramnani N, Toni I, Josephs O, **Ashburner J** & Passingham RE (2000): *Learning- and expectation-related changes in the human brain during motor learning*. *J. Neurophysiol.* 84(6):3026–3035

36. Lipschutz B, Friston KJ, **Ashburner J**, Turner R & Price CJ (2001): *Assessing study-specific regional variations in fMRI signal*. NeuroImage 13(2):392–398
37. Andersson JLR, Hutton C, **Ashburner J**, Turner R & Friston KJ (2001): *Modeling geometric deformations in EPI time series*. Neuroimage 13(5):903–919
38. Gitelman DR, **Ashburner J**, Friston KJ, Tyler LK, & Price CJ (2001): *Voxel-based morphometry of herpes simplex encephalitis*. NeuroImage 13(4):623–631
39. Andersson JLR, **Ashburner J** & Friston KJ (2001): *A global estimator unbiased by local changes*. NeuroImage, 13(6):1193–1206
40. Good CD, Johnsrude IS, **Ashburner J**, Henson RNA, Friston KJ & Frackowiak RSJ (2001): *A voxel-based morphometric study of ageing in 465 normal adult human brains*. NeuroImage 14(1):21–36
41. Brett M, Leff AP, Rorden C & **Ashburner J** (2001): *Spatial normalization of brain images with focal lesions using cost function masking*. NeuroImage 14(2):486–500
42. Good CD, Johnsrude I, **Ashburner J**, Henson RNA, Friston KJ & Frackowiak RSJ (2001): *Cerebral asymmetry and the effects of sex and handedness on brain structure: a voxel-based morphometric analysis of 465 normal adult human brains*. NeuroImage 14(3):685–700
43. Good CD, **Ashburner J** & Frackowiak RSJ (2001): *Computational neuroanatomy: new perspectives for neuroradiology*. Rev Neurol (Paris) 157(8-9):797–806
44. Toni I, Ramnani N, Josephs O, **Ashburner J** & Passingham RE (2001): *Learning arbitrary visuomotor associations: temporal dynamic of brain activity*. NeuroImage 14:1048–1057
45. **Ashburner J** & Friston KJ (2001): *Why voxel-based morphometry should be used*. NeuroImage 14:1238–1243
46. Watkins KE, Vargha-Khadem F, **Ashburner J**, Passingham RE, Connelly A, Friston KJ, Frackowiak RSJ, Mishkin M & Gadian DG (2002): *MRI analysis of an inherited speech and language disorder: structural brain abnormalities*. Brain 125:465–478.
47. Hutton C, Bork A, Josephs O, Deichmann R, **Ashburner J** & Turner R (2002): *Image distortion correction in fMRI: a quantitative evaluation*. NeuroImage 16(1):217–240.
48. Friston KJ, Penny W, Phillips C, Kiebel S, Hinton G & **Ashburner J** (2002): *Classical and Bayesian inference in neuroimaging: theory*. NeuroImage 16(2):465–483
49. Friston KJ, Glaser DE, Henson RNA, Kiebel S, Phillips C & **Ashburner J** (2002): *Classical and Bayesian inference in neuroimaging: applications*. NeuroImage 16(2):484–512
50. Salmond CH, **Ashburner J**, Vargha-Khadem F, Connelly A, Gadian DG & Friston KJ (2002): *Distributional assumptions in voxel-based morphometry*. NeuroImage 17(2):1027–1030
51. Good CD, Scahill RI, Fox NC, **Ashburner J**, Friston KJ, Chan D, Crum WR, Rosser MN & Frackowiak RSJ (2002): *Automatic differentiation of anatomical patterns in the human brain: validation with studies of degenerative dementias*. NeuroImage 17(1):29–46
52. Salmond CH, **Ashburner J**, Vargha-Khadem F, Connelly A, Gadian DG & Friston KJ (2002). *The precision of anatomical normalization in the medial temporal lobe using spatial basis functions*. NeuroImage 17:507–512

53. Critchley HD, Good CD, **Ashburner J**, Frackowiak RS, Mathias CJ & Dolan RJ (2003): *Changes in cerebral morphology consequent to peripheral autonomic denervation*. *NeuroImage* 18(4):908–916
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